ABSTRACT

Example methods of manufacturing an AND-type flash memory device are disclosed. One example method may include forming a tunnel oxide layer and a first polysilicon layer in sequence on a silicon substrate; forming a floating gate by removing some part of the first polysilicon layer; forming a source/drain region at both sides of the floating gate by implanting ions into the substrate; forming spacers on sidewalls of the floating gate; depositing a sacrificial layer on the resulting substrate; exposing some part of the substrate and the floating gate; forming a first trench on the exposed part of the substrate and a second trench on the exposed part of the floating gate; depositing an oxide layer to fill the first and second trenches with the oxide layer; removing the oxide layer and the sacrificial layer through a fourth etching process until the floating gate is exposed; removing the spacers and the remaining sacrificial layer to form the floating gate with the second trench and a trench-type device isolation layer; and depositing a gate insulating layer and a second polysilicon layer to form a control gate in sequence on the resulting substrate.